FTT vs Malnutrition: The Far Out Difference

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Objectives

- To understand the difference between failure to thrive (FTT) and malnutrition
- To evaluate the primary etiologies of FTT and malnutrition
- To demonstrate how to use the nutrition care process to assess patients with FTT and malnutrition
- To provide recommendations for evidence-based treatment for FTT and malnutrition

FTT VS MALNUTRITION

What is Failure to Thrive?

- Clinical finding vs diagnosis
- Requires serial measures of height and weight
- No consensus on the definition
  - "Weight for length or BMI below the 5th percentile"

  OR
  - "Sustained decrease in growth velocity, in which weight for age or weight for length/height falls by two major percentiles over time"

What is Malnutrition?

- "An imbalance between nutrient requirement and intake, resulting in cumulative deficits of energy, protein, or micronutrients that may negatively affect growth, development, and other relevant outcomes"
  - Illness vs. non-illness related
  - Acute (<3 months) vs Chronic (>3 months)
  - Requires only one data point in time

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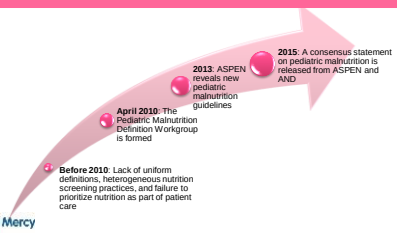
The Path to Defining Malnutrition



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The Impact of FTT and Malnutrition

Decreased height potential	Decreased head circumference
Increased hospital costs	Poor outcomes

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ETIOLOGY OF FTT AND MALNUTRITION

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3 Primary Causes of FTT and Malnutrition

- Decreased intake
- Increased needs
- Decreased absorption

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Decreased Intake

- Eating disorders
- Nausea and vomiting (ex: GERD)
- Mechanical feeding difficulties (ex: cleft palate)
- Delayed oral skills development
- Inappropriate formula preparation
- Inadequate opportunities to eat daily
- Neglect or abuse

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Increased Needs

- Trauma and burns
- Malignancies
- Congenital heart disease
- Metabolic and genetic disorders
- Some surgeries
- Immune dysfunction or chronic infection
- Hyperthyroidism

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Decreased Absorption

- Irritable bowel disease and other GI disease
- Cystic fibrosis
- Biliary atresia
- Celiac disease
- Metabolic and genetic disorders
- Milk protein allergy
- Chronic kidney disease

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COMPLETING A NUTRITION ASSESSMENT

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ADIME

- Assessment
- Diagnosis
- Intervention(s)
- Monitoring and Evaluation

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Assessment

- Food/nutrition-related history
  - Detailed diet recall
  - Consider 3-day food record or bottle log
- Anthropometrics and review of growth
- Review of labs (if available)
- Review of medications and allergies
- Review of medical history
- Mid parental height
- Nutrition-focused physical exam

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Food/Nutrition Related History

Feeding history	
Environment	Regular feeding routine at home and day care; who is living in the home
Family eating patterns	Cultural or religious food restrictions; Some Mexican families eat their "dinner" around 3:30 PM, then another meal around 7:30 PM
Preparation of food	Formula mixing technique and recipe (i.e. water or powder first), frequency of feedings (including overnight), use of baby foods and table foods
Resources	Use of WIC or Food Stamps, social workers, and home health visits; access to food supplies; cooking equipment in the home

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Food/Nutrition Related History

Personal and past medical history	
Medical conditions	Food allergies, gastroesophageal reflux, developmental delay, ambulatory vs wheelchair dependent
Prematurity	Gestational age, hx of requiring nutrition support as an infant
Surgeries	Short gut syndrome, hx of heart surgeries, etc.
Illnesses	Emergency department and office visits, hospitalizations, parasite exposure, exposure to endemic illnesses (e.g., tuberculosis)

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Food/Nutrition Related History

Family medical history	
Gastrointestinal conditions	Celiac disease, inflammatory bowel disease, cystic fibrosis
Parental childhood nutrition	Parental malnourishment, picky eating
Parental height, parental age at puberty	Genetic short stature, constitutional growth delay, mid parental height
Psychiatric illness, substance abuse	Affecting caretaker function
Social history	Relationship with peers and family members, bullying
Living conditions	Safety and comfort, ability of parents to provide appropriate nutrition
Parent-child relationship	Lack of attachment, inability to discipline
Primary caregivers	Parents, family members, foster family, grandparents
Stressors	Financial and emotional support for child and family, school environment

5 Big Questions

- "Has your child been sick?" (i.e. "Are there any days that your child did not achieve goal feeds/nutrition?")
- "How are you mixing the formula? What is your exact recipe?"
- "Are you concerned about your child's nutritional status?"
- "Why do you think your child isn't gaining enough weight?"
- "Can you walk me through a normal day of eating/drinking for your child?"

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Mid Parental Height

- For boys: [paternal height + (maternal height + 5 inches or 13 centimeters)] / 2
- For girls: [maternal height + (paternal height – 5 inches or 13 centimeters)] / 2
- https://ebmcalc.com/HeightPotential.htm

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Nutrition Focused Physical Exam

- " A systematic head-to-toe examination of a patient's physical appearance and function to help determine nutritional status by uncovering any signs of malnutrition, nutrient deficiencies, or nutrient toxicities."

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Nutrition Focused Physical Exam

- Areas to assess for subcutaneous fat loss
  - Orbital region-area around the eye
  - Buccal fat-cheek area
  - Upper arm-triceps/bicep area
  - Thoracic and lumbar region- ribs, lower back, mid axillary line

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Nutrition Focused Physical Exam

- Areas to assess for muscle loss
  - Temporal region-temporalis muscle
  - Clavicle area-deltoid muscle
  - Shoulders
  - Scapula region
  - Legs-quads, thighs, calves

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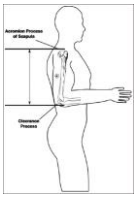
Anthropometrics: MUAC

- **Mid-upper arm circumference**: "The circumference of the left upper arm, measured at the mid-point between the tip of the shoulder and the tip of the elbow."
- Can be used as an **independent indicator** for diagnosing pediatric malnutrition and "should be part of the full anthropometric assessment in all patients."
- Can be a more sensitive prognostic indicator for mortality than weight-for-height in malnourished pediatric patients



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Anthropometrics: Growth Charts

- Use **WHO growth charts** for children up to 2 years of age
- Use **CDC growth charts** for children >2 year of age
- Use **specialty growth charts** (i.e. Fenton for prematurity, Trisomy 21 growth chart, etc.) as needed
- Remember to correct for gestational age for children born prematurely **<37 weeks**

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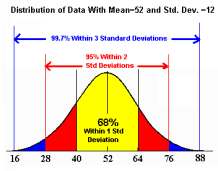
Anthropometrics: Z-Scores

- The Z-score is the standard deviation above or below the mean
  - 0 is the same as the 50th percentile
  - ± 1.0 plots at the 15th or 85th percentiles
  - ± 2 at the 3rd or 97th percentiles



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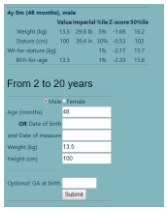
Anthropometrics: Using Peditools

- Use www.Peditools.org to calculate and compare z-scores for children.



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Classifying Malnutrition

Single Data Point Available	Mild Malnutrition	Moderate Malnutrition	Severe Malnutrition
Weight for height z-score (<2 years)	-1 to -1.9 z-score	-2 to 2.9 z-score	≤ -3 z-score
BMI for age z-score (>2 years)	-1 to -1.9 z-score	-2 to 2.9 z-score	≤ -3 z-score
Length or height z-score			≤ -3 z-score*
Mid-upper arm circumference	-1 to -1.9 z-score	-2 to 2.9 z-score	≤ -3 z-score

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*Do not use this criteria in patients with chronic disease such as chronic kidney disease, CP, CF, prematurity. Increased calories may increase fat deposition and not length increase.

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Classifying Malnutrition

Two or more data points available	Mild Malnutrition	Moderate Malnutrition	Severe Malnutrition
Weight gain velocity (<2 years)	<75% of normal for expectated weight gain	<50% of normal for expected weight gain	<25% of normal for expected weight gain
Weight loss (2-20 years)	5% usual body weight	7.5% usual body weight	10% usual body weight
Deceleration in weight-for-length/height z-score	Decline of 1 z-score	Decline of 2 z-score	Decline of 3 z-score

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Classifying Malnutrition

- Use PES Statements:
  - **Malnutrition** (mild, moderate, severe), (acute, chronic) **related to** (illness or medical condition, dietary intake, psychosocial factors, inflammation) **as evidenced by** (z -scores or percentages).
  - For example:
    - **Malnutrition** (mild, chronic) **related to** presumed inadequate energy intake in the setting of complex past medical history including prematurity and cerebral palsy **as evidenced by** BMI z-score of -1.30.
    - **Malnutrition** (severe, acute) **related to** presumed inadequate energy intake in the setting of RSV requiring recent admission **as evidenced by** 8% body weight loss x3 weeks.

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INTERVENTIONS FOR FTT AND MALNUTRITION

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Most Effective Interventions for FTT/Malnutrition

- Supplemental beverages
- Feeding structure
- Snacks
- Adding extra calories
- Picky eating

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Supplemental Beverages

- Pediasure, Carnation Instant Breakfast, Super milk (8 oz whole milk + 2 tbsp heavy whipping cream), etc.
- How to use supplements to optimize weight gain:
  - Give only 4 oz (1/2 can) at meals and sometimes snacks. Water ONLY in-between meals/snacks to encourage hunger.
  - If a child is preferentially drinking their supplement, consider giving them food first for 10 minutes, then Pediasure after.
  - Limit juice to 0-4 oz/day



Ellyn Satter's Division of Responsibilities

Caregiver's Job	Child's Job
What food to offer	What to eat
When to offer food	How much to eat

Feeding Structure Tips

- Offer 3 meals and 2-3 snacks daily.
- Give all meals and snacks at the dinner table or high chair
- Encourage family meals and set a good example
- Limit meals to 30 minutes and snacks to 20 minutes
- Do not make your child a separate meal/snacks
- Ensure there is at least one food on the table you know they will accept
- Let children feed themselves

Feeding Structure Tips

- Do not label food as "good" or bad"
- Do not use food as a reward of punishment
- Do not pressure, force or bribe a child to eat
- Let children help in the kitchen
- Present food from all food groups
- Do not allow distractions during meals/snacks (no phone/screen policy)
- It is OK to say "no" or "not yet" to children

Sample Feeding Schedule

Time of Day	What to Offer	Beverage
7:30 AM Breakfast	3-4 food groups	4 oz supplement
10 AM Snack	2-3 food groups	4 oz supplement
12:30 PM Lunch	3-4 food groups	4 oz supplement
3:30 PM Snack	2-3 food groups	4 oz supplement
6 PM Dinner	3-4 food groups	4 oz supplement
8 PM Snack	2-3 food groups	4 oz supplement

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Snacks are "Mini Meals"

- Limit snacks to every 2.5-3 hours (no more than 3 per day).
- Do not allow grazing.
- Snacks should contain 2-3 food groups.
- Try to include one "high calorie" food with snacks.




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Snacks are "Mini Meals"

Protein	Fat	Fruits/Vegetables	Grains
• Whole milk • Fruit flavored, full-fat yogurt • String cheese* • Peanut, almond or cashew butter* • Cheese slices/cubes • Cottage cheese • Boiled egg *Allergen Friendly***: • SunButter* • Coconut yogurt with added protein • Seeds (sunflower, chia, flax, pumpkin)*	• Butter • Cream cheese • Cheese • Cream • Ranch dressing *Allergen Friendly***: • Avocado/guacamole • Hummus • Coconut oil/butter • Olive oil or other vegetable oils • Canned coconut milk or cream • Vegenaise®	• Applesauce • Peach • Apple • Orange • Strawberries • Watermelon • Banana • Raisins* • Baby carrots • Broccoli • Cauliflower • Celery • Cucumbers • Jicama	• Whole grain bread • Triscuit® crackers • English muffin or bagel • Flour tortilla • All-Bran crackers • All-Bran, Fiber One® or Kashi cereal bars® • Frosted Mini-Wheat®/Quaker Oat Squares® • Crunchy Corn Bran • Fig Newtons • Granola bars • Wheat Thins® • Small pretzels *Allergen Friendly***: • Gluten-free oatmeal • Gluten-free crackers • Corn tortilla • Rice or quinoa

Add Extra Calories

- Butter or oil (1 tbsp=100-120 kcals)
- Cream cheese (1 tbsp=50 kcals)
- Heavy whipping cream (1 tbsp=50 kcals)
- Cheese (1 oz=90-110 kcals)
- Full fat yogurt (4 oz=140 kcals)
- Avocado (1/2=160 kcals)
- Nut butters, cookie butter or Nutella (1 tbsp=90 kcals)
- Chia seeds, flaxseeds (1 tbsp=50-70 kcals)
- Maple syrup (1 tbsp=50 kcals)
- Chocolate syrup (1 tbsp=50 kcals)
- Nuts (1 oz=160 kcals)




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Add Extra Calories

- Hummus (1 tbsp=25 kcals)
- Full fat cottage cheese (1/2 cup=100 kcals)
- Bagels (1/2 bagel= 25 kcals)
- Oats (1/2 cup=150 kcals)
- Beans (1/2 cup=100 kcals)
- Eggs (1 egg=80 kcals)
- Pancakes (1 4" pancake=85 kcals)
- Duocal (1 scoop=25 kcals)
- Benecalorie (1 container=330 kcals)





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Practice With Extra Calories

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Picky Eating vs Problem Feeding

PICKY EATERS	PROBLEM FEEDERS
Limited variety of foods but will eat more than 30 foods	Restricted variety of foods and usually eats less than 20 foods
Foods child stops eating are re-accepted after a 2-week break	Liked foods that child stops eating are not re-accepted
Will tolerate new food on plate	Cries/gets upset with new foods
Will add new foods to selection after 15-25 exposures	Takes more than 25 exposures for child to add to selection
Will eat more than 1 food from most food groups and texture groups	Refuses entire food groups or certain textures
Typically eats with the family, but may not eat what family eats	Often eats alone, usually does not eat what family eats
Sometimes called a "picky eater" at well-child check	Regularly called a "picky eater" at multiple well-child checks

Adapted from Dr. Kay A. Toomey toomey@starcenter.us copyright 2000/2010

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Feeding Exposure Therapy

- Stop talking about food in "likes" and "dislikes"
- Remind families that their child is still too young to pass strong judgements about food
- Have a positive, curious and explorative attitude about new foods
- Ask kids to use adjectives to describe their food
- Ignore behavior when kids say food is "nasty," throw a tantrum, etc.
- Praise and celebrate children when they interact with new foods
- Introduce new or non-preferred foods in many different ways

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Feeding Exposure Therapy

- Ask children to interact with foods in one of 5 ways:
  - Tolerate it on their plate
  - Touch it
  - Kiss or lick it
  - Eat one bite
  - Eat more than one bite

Date	What food did I interact with?	How did I interact with it?	How would I describe it?

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Picky Eating

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IMPLICATIONS FOR FUTURE PRACTICE

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Implications for Future Practice

- Nutrition professionals must consider **the impact of language** (FTT vs malnutrition) on our assessment.
- It is critical to understand the **etiology of malnutrition or FTT** to select an appropriate treatment.
- A thorough and **informative assessment** can be completed, even with limited time and resources.
- Nutrition professionals can provide **targeted interventions** to significantly decrease the prevalence of FTT and malnutrition.

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Questions

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